

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF WISCONSIN

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MICHIGAN MILLERS MUTUAL INSURANCE CO.  
and GRAND RIVER COOPERATIVE,

Plaintiffs,

v.

Case No. 04-C-853

HAMILTON BEACH/PROCTOR-SILEX, INC.,

Defendant.

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**FINDINGS OF FACT AND CONCLUSIONS OF LAW  
AND ORDER FOR JUDGMENT**

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**INTRODUCTION**

Early in the morning of August 8, 2002, a fire broke out in the break room of the Grand River Cooperative (“GRC”) feed mill located in Markesan, Wisconsin. Based on its investigation of the fire, Michigan Millers Mutual Insurance Company (“Michigan Millers”), GRC’s insurer, concluded that the fire was started by a defective coffee maker manufactured and sold by Hamilton Beach/Proctor Silex (“HB/PS”) and commenced this action in state court to recover the amount it paid GRC for the loss. GRC also asserted a claim against HB/PS for recovery of its deductible under the policy. The case was tried to the court over a three-day period beginning on January 16, 2007. Based on the stipulation of the parties and the evidence presented at trial, the court hereby makes the following findings of fact and conclusions of law:

## **FINDINGS OF FACT**

1. Michigan Millers is a Michigan corporation with its principal place of business in Lansing, Michigan.

2. GRC is a Wisconsin cooperative corporation with its principal place of business in Markesan, Wisconsin.

3. HB/PS is a Delaware corporation with its principal place of business in Glen Allen, Virginia.

4. GRC operates a feed mill in Markesan, Wisconsin. The feed mill was insured for fire loss under an insurance policy issued by Michigan Millers.

5. Terry Zimdars is the General Manager of GRC. At the time of the fire, he was the feed department manager.

6. On August 8, 2002, a fire occurred at the feed mill. The fire was discovered by a workman, Andrew Manderscheid, at about 5:00 a.m. Andrew Manderscheid worked as a millwright for Farm Valley Services. He discovered the fire when he arrived at GRC to do maintenance work on some equipment.

7. The fire started in the employee break room of the office area in the feed mill. The fire was fully involved and substantially consumed the break room. Michigan Millers concluded that the amount of the loss was \$213,016.31 and, after subtracting GRC's \$1,000 deductible, paid GRC the sum of \$212,016.31 pursuant to the terms of its policy.

8. There were several electrical devices in the break room, including a coffee maker, toaster, George Foreman grill, hot plate, box fan, oscillating fan, space heater, extension cords, and vending machine.

9. Prior to the fire, the coffee maker and toaster were kept on a cart near the east wall of the break room. Other electrical devices in the room included an oscillating fan, a box fan, a hot plate, a vending machine and a heater.

10. The fire department investigated the fire and classified the cause of the fire as "undetermined." Fire Chief Thomas Wilde testified that he was unable to determine the point of origin or the ignition source of the fire, but believed that the area of origin was on the east wall of the break room behind the cart on which the toaster and coffee maker were located.<sup>1</sup>

11. Michigan Millers hired Ryan Kelm of EFI, Inc. to conduct a fire scene investigation. Kelm conducted his examination of the fire scene on August 12 and 14, 2002. Paul Hansen, an electrical engineer from EFI, was present during the examination on August 14. At that time, Hansen photographed the scene and removed certain items, including the coffee maker, toaster, and electric fans.

12. Kelm concluded from his analysis of the burn pattern in the structure and debris that the fire originated on the east wall of the break room in the area of the cart where the coffee maker and toaster were located.

13. While sifting through the debris on August 14, 2002, Kelm and Hanson located the remains of the appliances. With the exception of the coffee maker, Hanson concluded from his visual examination of what was left of the appliances that they did not cause the fire. His

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<sup>1</sup>HB/PS objected to Chief Wilde's testimony concerning the area of origin of the fire on the ground that he was not qualified under Fed. R. Evid. 702 and *Daubert v. Merill Dow Pharm., Inc.*, 509 U.S. 579 (1993), to render such an opinion. The court overruled the objection based on the fact that Chief Wilde had been a firefighter for more than thirty years and had attended classes on arson investigation which included study of cause and origin of fire. Because Chief Wilde's qualifications are questionable, the court has given little weight to his opinion as to the area of origin of the fire.

conclusion was based on his observation that the damage to the interior of the appliances was less severe than the damage to the exterior.

14. Various components of the HB/PS coffee maker were found in the area of the cart along the east wall of the break room. These included the heating element with most of the aluminum casing burned away, the thermostat, two thermal cut-offs, the steel base plate, and various pieces of glass from the carafe.

15. Based upon his visual examination of the recovered components of the coffee maker, particularly the heating element and pieces of the carafe, Hanson concluded that the fire was ignited when the coffee maker underwent thermal runaway after it was left on and plugged into the electrical outlet on the evening of August 7, 2002.<sup>2</sup>

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<sup>2</sup>HB/PS also objected to Hanson's qualifications to render an opinion as an expert concerning thermal runaway since he had done no testing or research to support his theory. In HB/PS's view, Hanson's opinion amounted to mere speculation as to a possible cause and did not meet *Daubert's* standards for admitting expert testimony. HB/PS also argued that because Hanson had no expertise in appliance design or in metallurgy or glass technology, he was not qualified to testify that component parts of the coffee maker were defectively designed or manufactured. The court took HB/PS's objections under advisement. Having considered them in light of the evidence as a whole, the court now overrules the objection. Hanson testified as an electrical engineer with more than ten years of experience in forensic electrical investigations. He was familiar with the phenomenon of thermal runaway, which is not a novel theory unknown to experts in the field. HB/PS's own experts recognized thermal runaway as a possible cause of fire and a risk that must be guarded against. It has clear support in the technical literature with which Hanson was familiar. Degrees in metallurgy are not required to testify about failure of the electrical components at issue here. Hanson's testimony, like that of many experts in fire cases, was based on reasonable inferences drawn from the evidence that the coffee maker was the ignition source and the lack of evidence of other ignition sources. *See, e.g., Allstate Ins. Co. v. Hamilton Beach/Proctor Silex, Inc.*, No. 04-6282-CV, \_\_ F.3d \_\_, 2007 WL 29977 (2d. Cir. Jan. 5, 2007). While Hanson, by his own admission, is not an expert in glass technology, his opinion concerning the deformed appearance of some of the remnants of the glass carafe were admissible as lay opinion and did not require such expertise. *See Fed. R. Evid. 701.*

16. Thermal runaway occurs when the safety mechanisms designed to shut off the electrical current to a heating element fails and the increasing heat eventually destroys the appliance. Thermal runaway can also ignite a fire.

17. The fact that the aluminum casing for the heating element had, for the most part, melted away led Hanson to conclude that the fire had originated inside the coffee maker. Although he conceded that the aluminum had not melted away in the symmetrical pattern that is typical when thermal runaway occurs, Hanson explained that heat produced by the resulting fire was responsible for the non-symmetrical pattern. Hanson found further support for this conclusion from the fact that some of the glass fragments from the bottom of the carafe were melted whereas fragments from the upper portion or rim did not appear to be melted. In addition, the steel base plate for the coffee maker showed greater damage on the interior than the exterior.

18. The coffee maker was a Model A607A auto drip-style coffee maker. It was manufactured by Hamilton Beach during the week of May 21, 2000. The Care and Use Guide for the coffee maker under the section entitled, CONSUMER SAFETY INFORMATION, cautions that the coffee maker is intended solely for household use. The instructions also advise the user to turn off and unplug the coffee maker when not in use.

19. The design of the coffee maker includes a heater subassembly which is controlled by a thermostat which regulates the temperature of the heating element. When the thermostat is closed, the switch contacts are "on" and the heating element is heated until the thermostat reaches approximately 295° F. The thermostat then opens, thereby interrupting the electrical circuit to the heating element. When the temperature of the thermostat falls to 255° F, it closes and current again flows to the heating element.

20. The coffee maker is also designed with two thermal cutoffs ("TCO"), which function as thermal fuses to prevent the coffee maker from overheating in the event the thermostat fails in a closed position. The TCOs are wired in series with the thermostat. The TCOs are designed to be in the closed position, which allows electrical current to flow through them. The TCOs are designed to open at certain temperatures above the operating range of the thermostat. Once a TCO opens, the electrical current is stopped and the heating element no longer heats. The TCOs, therefore, function as redundant safety devices to prevent the coffee maker from overheating. The first TCO is rated to open at 363° - 378° F. The second TCO is rated to open at 441° - 442° F.

21. The coffee maker switch showed red when in the "on" position.

22. In order for thermal runaway to occur in the coffee maker, four conditions must exist: (1) the coffee maker must be "on;" (2) the thermostat must fail in the closed position; (3) the first TCO must fail to activate; and (4) the second TCO, which is rated for a higher temperature than the first TCO, must also fail to activate.

23. GRC sold coffee makers and other small household electrical appliances in its hardware store attached to the feed mill. The coffee maker in the break room had been obtained from GRC's inventory. GRC never experienced any problems with the coffee maker.

24. The coffee maker was not used every day, especially in the summer. It would be used if one of the employees wanted coffee in the morning. It was generally used only in the morning to make one pot of coffee.

25. The feed department and office were open from 7 a.m. to 5 p.m. At closing, it was Zimdars' procedure to walk around and shut off the lights and equipment and unplug the fans and air conditioner.

26. There was no testimony that the coffee maker was turned on or plugged into an electrical outlet, or even that it was used on the day before the fire. No baked-on coffee residue was found on the pieces of the glass carafe found at the scene. The coffee maker was generally unplugged when it was not in use.

27. On September 17, 2002, Scott Barnhill of Accident Reconstruction Analysis, Inc. conducted an investigation of the fire scene at the request of Hamilton Beach/Proctor-Silex, Inc. ("HB/PS"). Barnhill has a Masters degree in Engineering and a Bachelors degree in Materials Science and Engineering. He is also a certified fire investigator, and conducts approximately 75 fire scene investigations per year. Kelm and Hansen also participated in the investigation.

28. Prior to the filing of this action, Hansen did not conduct any laboratory examination of the coffee maker or the other items recovered from the fire scene. He did have X-rays taken of the thermostat and TCOs.

29. After plaintiffs filed this action, they produced the coffee maker to HB/PS for a nondestructive examination. John Datovech, HB/PS's Director of Product Assurance and Licensing Quality conducted the examination on March 17, 2005. As part of his examination, Datovech took photographs and x-rays and took electrical measurements of the coffee maker.

30. X-rays taken of the thermostat and TCOs show that the thermostat and both TCOs are in the open position. If the thermostat is open, then the heating element is not being heated. If either TCO is in the open position, then there is no electricity flowing to the circuit and no power to the heating element.

31. In Hanson's opinion, the fact that the thermostat and both TCOs were in the open position is not inconsistent with his theory of causation. He believes the thermostat outlived its

useful life and became welded in the on position. The TCOs then failed to open at their rated temperatures, thereby causing the heating element to overheat, melt the aluminum casing and melt the carafe before igniting the plastic casing and starting the fire. The heat of the resulting fire then melted away the weld on the thermostat, thereby allowing it to open, and finally activated the TCOs, causing the breaks in the circuit that should have occurred earlier. Hanson performed no tests to confirm his hypothesis, but instead relied upon his experience in investigating similar fires and the literature in the field. He also concedes he is not an expert in glass technology or fracture analysis.

32. Barnhill, HB/PS's fire expert, testified that the extent of the fire precluded him from determining where precisely in the break room the fire originated. Barnhill noted that once a room goes to full involvement and the ceiling or roof collapses, then conclusively defining an origin area smaller than the room based on burn patterns becomes difficult. Barnhill noted that the fact that the only intact ceiling joist in the entire room was the one closest to the east wall suggested that the fire did not originate at that location. In addition, the area along the east wall where the coffee maker was located showed less damage than many other areas of the break room. Moreover, similar v-shaped burn patterns of the kind that Kelm relied upon for his conclusion could be seen in other areas of the room. In Barnhill's view, secondary burn that occurred when the ceiling collapsed and additional fuel fell into the room precluded a definitive conclusion as to where the fire originated.

33. Barnhill disagreed with Hanson's conclusion that the other electrical appliances that were in the break room could be ruled out as a cause of the fire. He noted that the aluminum casing of the oscillating fan had melted and a power cord and other wiring showing evidence of arcing had been found in the debris. He also noted damage to the interior components of the water cooler that prevented him from ruling it out as a possible ignition source. In addition, Barnhill testified that



the fire had consumed parts of appliances so that it was impossible to determine whether they had ignited the fire.

34. With respect to the coffee maker, Barnhill noted that the open thermostat and TCOs demonstrated that it did not ignite the fire. He testified that there is no evidence the thermostat failed and rejected Hanson's conclusion that a weld on the thermostat could have melted away in the heat of the fire. Barnhill noted that the contacts of the thermostat showed no loss of mass that would be present if arcing had produced a weld at that location that then melted away in the fire. The same was true of the TCOs--there was no evidence of a weld on the contacts.

35. Barnhill stated his conclusion that thermal runaway had not occurred was supported by his examination of the heating subassembly of the coffee maker. The heating subassembly is a horseshoe-shaped device made up of several components. The heating element itself is a spiral-shaped nichrome wire, which is encapsulated by a magnesium oxide electrical insulating compound inside a steel sheath. Cold pins at the two ends of the horseshoe-shaped subassembly connect the heating element to the current. The steel sheath is covered by an aluminum extrusion, the cross-section of which is a "figure 8". The steel sheath containing the heating element is in encased in one of the "o"s of the "8", and water is heated as it passes through the other when coffee is being brewed. The heater subassembly also keeps the warmer plate hot.

36. Barnhill testified that the fact that the aluminum casing melted was not surprising in and of itself since aluminum components of other appliances also melted in the fire. However, in Barnhill's view the fact that the aluminum casing for a substantial portion of the heating element was still intact was inconsistent with thermal runaway. When thermal runaway occurs, the melting of the aluminum casing starts at the apex of the heating element where the temperature is greatest

and then proceeds along both sides symmetrically to the point where the internal resistant coil of the heater subassembly contacts the cold pins within the steel casing. Because the cold pins do not generate heat, thermal runaway does not melt the portion of the aluminum casing that covers the ends of the heating subassembly. Examination of the heating subassembly recovered from the break room not only showed a non-symmetrical melting of the aluminum casing, but also melting over the cold pins. In Barnhill's opinion, this was proof that thermal runaway had not occurred.

37. John Datovech, HB/PS's Director of Product Assurance, is a mechanical engineer and testified as an expert concerning the coffee maker. Datovech agreed with Barnhill that analysis of the coffee maker components supported the conclusion that the coffee maker did not undergo thermal runaway and ignite the fire. In addition, Datovech testified that the steel base plate showed more oxidation on the inside than the outside because the plastic cover of the coffee maker melted away as a result of the fire, thereby leaving the top, or inner side, exposed to the fire and radiant heat, while the underside was protected by the cart on which it was resting. Once the cart collapsed, the base plate could have been in either position, and in view of the fire suppression efforts that could have further increased the amount of oxidation, Detovech concluded that the amount of oxidation on one side of the base plate verses the other was not suggestive of where the fire had started.

38. With respect to the glass carafe, Datovech testified that thermal runaway does not cause glass to deform. He also testified it was impossible to determine whether the deformation in the glass occurred when the carafe was seated on the heating plate or when it had fallen to the floor. Datovech based this opinion upon a test he had directed in which two carafes, one with coffee left in it and one empty, were subjected to thermal runaway to the point where the coffee maker caught

fire. Neither carafe melted or underwent any deformation as a result of the heat generated by thermal runaway. Based on this experiment, Datovech concluded that the deformation in the carafe pieces found at the scene of the fire in this case was caused by the intense heat of the fire and not thermal runaway. He also noted that other deformed or melted pieces of glass not associated with the coffee maker were found in the debris.

39. Based on the above, the court is unable to find by a preponderance of the evidence that the HB/PS Model A607A auto drip-style coffee maker was the cause of the fire that damaged the GRC break room on August 8, 2002. While plaintiffs have presented a theory as to how the fire could have been caused by the coffee maker, the evidence is insufficient to support their theory. The coffee maker would have had to remain on throughout the previous day from early morning, when it might have been used, past 5:00 p.m., when everyone left for the day. No one even recalls whether it was used that presumably hot August day, and there is no evidence it was plugged into an outlet. For plaintiffs' theory to prove true, not only would the coffee maker had to have remained on all day with no one noticing the heat and possible smell that would have emanated from it, but Zimdar, whose normal practice was to walk around and make sure the appliances were turned off and unplugged at the end of the day, would had to have failed to see that the coffee maker was on and plugged into an outlet. In addition, the thermostat would have had to fail, well short of its useful life, and both TCOs would have had to fail simultaneously. According to Datovech, no such failure had ever been reported in this model coffee maker before. Despite the implausibility of all of these contingencies occurring at the same time, plaintiffs' theory would still carry the day if the component parts of the coffee maker unequivocally demonstrated that thermal runaway had occurred. Unfortunately, they do not. The evidence offered by the defense casts doubt on Hanson's

testimony that the condition of the heating subassembly of the coffee maker proves it underwent thermal runaway. The asymmetrical pattern of the aluminum casing left on the heater assembly is inconsistent with thermal runaway and the absence of any evidence of arcing at the contact points of the thermostat seems inconsistent with the mechanism of failure described by Hanson. Moreover, Datovech's experiment of inducing thermal runaway on two coffee makers to determine the effect on the carafe calls into question Hanson's theory that the melted pieces of the glass carafe recovered from the fire support a determination that thermal runaway occurred. The evidence offered by plaintiffs in an effort to disprove other possible ignition sources also came up short. Hanson's testimony that comparing interior verses exterior damage is a sufficient basis for ruling out other appliances was not adequately supported. After all, a fire can be ignited from a faulty power cord. *See, e.g., Allstate Ins. Co. v. Hamilton Beach/Proctor Silex, Inc.*, 2007 WL 29977 (2d. Cir. Jan. 5, 2007). Would a fire started in this way produce more interior than external damage to the appliance of which it was a part? Defendants offered clear evidence that electrical activity had occurred in another appliance, i.e., arcing of wires in unrelated power cord, at the time of the fire, if not earlier. The court is not even convinced that the fire originated on the east wall in the area of the cart on which the coffee maker and toaster were located. Barnhill's testimony that the area of origin was obscured because the fire had fully engaged the break room and the ceiling collapse added fuel that resulted in areas of secondary burn seems reasonable. The court is therefore unable to find that the HB/PS coffee maker was defectively designed or manufactured and that it caused the fire in the GRC break room. The court also finds no negligence on the part of HB/PS in connection with its design, manufacture or sale of the coffee maker.

Based upon these findings of fact, the court enters the following conclusions of law:

### **CONCLUSIONS OF LAW**

1. The court has diversity jurisdiction over the claims of Michigan Millers pursuant to 28 U.S.C. §1332. The dispute is between citizens of different states and the amount in controversy exceeds \$75,000, exclusive of costs and interest. The court has supplemental jurisdiction over GRC's claim pursuant to 28 U.S.C. § 1367 because it is so related to the claim of Michigan Millers that it forms part of the same case or controversy.

2. Under Wisconsin law, a plaintiff must prove the following five elements for strict product liability: a) that the product was in a defective condition when it left the possession or control of the seller; b) that it was unreasonably dangerous to the user or consumer; c) that the defect was a cause (a substantial factor) of the plaintiff's injuries or damages; d) that the seller was engaged in the business of selling such product, or, put negatively, that this is not an isolated or infrequent transaction not related to the principal business of the seller; and e) that the product was one which the seller expected to and did reach the user or consumer without substantial change in the condition it was when he sold it.

3. That in order to prove negligence, a plaintiff must establish the following four elements: a) a duty of care on the part of the defendant; b) a breach of that duty; c) a causal connection between the conduct and the injury; and d) an actual loss or damage as a result of the injury.

Based upon the above findings of fact, the court concludes that plaintiff has failed to establish that HB/PS is liable either under a product liability theory or negligence theory.

Accordingly, plaintiffs' claims against HB/PS are hereby ordered dismissed on their merits and HB/PS is entitled to statutory costs. The clerk is directed to enter judgment.

**SO ORDERED** this 25th day of January, 2007.

s/ William C. Griesbach  
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William C. Griesbach  
United States District Judge